

THE PERSISTENCE OF THE DOUBLE-FLOWERED FORM OF CELANDINE POPPY.

In September of 1917 Karl Sax of the Bussey Institution sent to the editors of *Genetics* an article entitled "The Inheritance of Doubleness in *Chelidonium majus* Linn." which was published in that journal the following year (*Genetics* 3: 300-307. 1918). The origin of the material Sax studied was not specified beyond the fact that "a double- and a single-flowered plant growing near the Bussey Institution were transplanted and reciprocal crosses made." Sax does not make clear whether the plants he obtained were under cultivation or spontaneous as a portion of the weedy flora. Apparently no herbarium specimens were prepared of the material studied and spontaneous plants were not found, recorded or preserved by Palmer in his study of the spontaneous flora of the Arnold Arboretum grounds (*Journal Arnold Arb.* 11: 100. 1930). Across South Street from the headquarters and the greenhouses of the Bussey Institution the Arnold Arboretum built a house which was occupied by E. H. Wilson from its construction until his death in 1931 and subsequently by Karl Sax. To the rear of this house is a low marshy area of land which has served as a dumping ground for greenhouse soils, pruning debris and discarded plants from the nurseries and experimental plots. Recently it has been possible to fill this marshy area more rapidly and so a routine examination of the area was made for unusual plants which might be effected by changes of soil level or of drainage or which should be preserved from damage through the filling process. This survey revealed a small population of *Chelidonium majus* with single- and double-flowered plants intermixed. We suspect that these are the descendants of the plants Sax had studied and had discarded in the swampy area. A set of specimens was prepared to record the presence of the double-flowered form in 1966 and in the process of preparing labels for these specimens a problem of nomenclature of the form and a conflict of names was discovered.

References to a double-flowered form of *Chelidonium majus* in the literature are numerous but specimens of such forms are exceedingly rare in herbaria. J. Gilbert in 1798 (*Histoire des Plantes de Europe* 1: 167. 1798) acknowledged that in cultivation a double-flowered form was produced. De Candolle (*Regni Vegetabile Systema Naturale* 2: 99. 1821) refers to both simple and double forms in his treatment of *Chelidonium majus*. Nicholson in the first edition of the *Dictionary of Gardening* (1: 310. 1884) noted that there was "also a double-flowered form." Henslow (*British Wild Flowers in Their Natural Colours and Form* 18. 1910) stated "*C. grandiflorum* from Dahuria, *C. laciniatum* from South Europe, and the double form of our own wild species are cultivated as garden plants." However, the treatment of the genus in *Flora Europaea* (1: 251. 1964) makes no mention of the double-flowered form, and no name for this appears in the contemporary European floras examined. It has been possible to check the herbaria at Edinburgh, Kew, and the British Museum and no double-flowered specimens were found.

The date of the introduction of the double-flowered form into the United States is not recorded and the extent of its distribution is unknown. None of the editions of Gray's *Manual of Botany* or of the Britton and Brown *Illustrated Flora* or the local floras examined makes any mention of the existence of a double-flowered Celandine Poppy. There are only two such specimens in the herbarium of the New England Botanical Club: one from Milton, Massachusetts collected in 1917, and one from Fairfield, Connecticut collected in 1937. No specimens have been found in herbaria at New York, Washington, or Philadelphia.

Bailey's *Manual of Cultivated Plants* (p. 428. 1949) calls *Chelidonium* a monotypic genus in temperate Europe and Asia comprising a biennial or perennial herb, often in old gardens, sometimes double-flowered. An inquiry to the Bailey Hortorium was answered with the information that several European nurseries offered seed of a "Chelidonium

majus florepleno" and that a varietal name had been published in 1955. I am grateful to the staff at the Bailey Hortorium for the suggestions which prompted a search of various nursery catalogues and seed lists of botanical gardens. A seed list from the botanical garden at Antwerp for example (1963 *Delectus Sporarum Seminum Fructuum, Hortus Botanicus Antverpiensis*, p. 12. 1963) shows that the name "Chelidonium majus L. flore-pleno" is still in use in the 1963 edition, although no valid publication of the name can be found.

The description of the double-flowered variety was published by André Lawalrée in 1955 (*Brussels Bull. Jard. Bot. de l'Etat* B 25: 409, 410. 1955) with the name *Chelidonium majus* var. *pleniflorum* Lawalrée. He indicated the variety had up to 20 petals with 7-14 stamens. The holotype in the Brussels herbarium was collected by J. Tijskens s. n. in May 1953 in the district Campinien, Bonheiden along the route to Malines above the village of Kiwit in Belgium. A search of the scanty European collections in the Gray Herbarium then revealed one double-flowered specimen collected by Keinheinz near Potsdam in 1962. This discovery prompted an examination of Parey's *Blumengärtnerei* where (2nd ed. 1: 679. 1958) the treatment of *Chelidonium* prepared by C. R. Jelitto used the name *C. majus* var. *plenum* Wehrh. a reference we found repeated in the seed list of the Leiden Botanical Garden issued in 1954 (*Hortus Botanicus Academicus Lugduno-Batavus, Delectus Seminum* 19. 1954). Finally, the description of the double-flowered form by H. R. Wehrhahn was found in *Die Gartenstauden* (5: 464. 1930) as *Chelidonium majus* L. "var. *plenum* hort. Mit gefüllten Blüten. Merkwürdig ist, dass alle (auch die hier nicht genannten Formen) völlig samenbeständig sind."

This tortuous search for a name, an authority and a description comprising valid publication was given in detail to indicate the significance and the close relationship of horticultural and botanical literature. Perhaps the double-

flowered *Chelidonium majus* existing as a cultivated plant should be regarded as a cultivar and named as *Chelidonium majus* 'Plenum.' Its existence as a weed persisting in a dump area indicates it is also a part of the local flora of Massachusetts and as such its correct name had to be sought and found in the literature of cultivated plants in Europe.

The correct name for a double-flowered Celandine Poppy is: **Chelidonium majus** L. var. **plenum** Wehrhahn, *Die Gartenstauden* 5: 464. 1930.

C. majus var. *pleniflorum* Lawalrée, Brussels Bull. Jard. Bot. de l'Etat 25: 409, 410. 1955.

C. majus L. 'Flore-pleno' Hort. lacking known valid publication.

Specimens seen. United States. Massachusetts: Jamaica Plain, *R. A. Howard 16101* (NEBC), Milton, *N. T. T. Kidder s. n.* (NEBC). Connecticut: Fairfield, *E. H. Eames 11829* (NEBC).

The persistence of the collection from which Sax may have obtained his material for a period of 50 years led us to re-examine the nature of the double-flowered form. Sax's breeding experiments were not repeated but a simple count was made of floral parts of mature double flowers selected from 100 different plants. These showed petals ranging in number from 12 to 22 in individual flowers, averaging 18.19, while the stamens of the same flowers ranged in number from 6 to 19 and averaged 11.52. The average total number of petals and stamens in the double forms was 29.71. From his breeding experiments Sax had concluded that the double-flowered form was recessive and the variation in petal number and of stamen number was greater than in the single-flowered forms. However, he found that the sum of the petal number and the stamen number was about the same in all individuals whether single- or double-flowered. The mean sum of the petals and the stamens of the double-flowered forms in Sax's report was 29.49.

There appears to have been little change in the population of the double-flowered *Chelidonium* when left alone for 50 years.

RICHARD A. HOWARD
ARNOLD ARBORETUM
JAMAICA PLAIN, MASS.